FET closes the circuit that discharges the batteries. In one implementation of the discharge circuit, the power from the discharge circuit comes from the main batteries themselves. Because the discharge circuitry can function down to extremely low battery voltages, the batteries are effectively discharged by the time the discharge circuit is unable to function.

[0051] An alternate implementation uses a separate, non-hazardous, small battery to operate the discharge circuitry. This implementation ensures that the main batteries are completely discharged. The discharge circuit dissipates power through the resistive wire that during battery discharge, dissipates the energy as heat. The resistive wire is wrapped around a piece of monofilament (fishing) line. When the battery power is dissipated through the resistive wire, the monofilament line is melted through and the neck connecting the balloon to the platform is released from the payload. Another advantage of providing a separate power source for the discharge circuit is that the discharge circuit battery will supply the resistive element with power to cut the monofilament line even if the main batteries are dead. As an alternative, the discharge circuit could dissipate power through a high power resistor if the neck release function were not used.

[0052] If the processor senses any of the conditions necessary to initiate termination, it ceases sending the keep alive signal to the discharge circuit. If the processor dies or the power fails, the keep alive signal also ceases, causing termination. The timer advances to a point where it initiates the battery discharge. Battery current flows through the resistive wire discharging the batteries and melting through the monofilament to release the balloon neck. The battery discharge continues until the main batteries are completely dead.

[0053] The main platform batteries are fully discharged during descent and if needed upon landing to positively terminate and prevent further radio transmission. Once discharge is initiated, the batteries fully discharge eliminating the chance of transmitting with significant power. . The battery discharge can be initiated by the processor as described above or automatically when power or processor control is lost. It has been found that long duration platform flight at high altitudes and cold temperatures requires special high-density power and functional capabilities at low temperatures. It has been found that lithium batteries beneficially fulfill such requirements. Additionally, it was found that the Environmental Protection Agency (EPA) states that lithium based batteries are considered hazardous waste except for one type of cell and only when fully discharged. Particularly it has been found that Lithium Sulfur Dioxide (LiSO2) batteries, when fully discharged, form a lithium salt, which is not considered hazardous by the EPA. Automatically discharging the LiSO2 batteries before they contact the ground not only prevents the transmitter from transmitting but also renders the batteries non-hazardous for environmentally acceptable landing on the ground.

[0054] Use of a novel and integral "maple seed" like descent device to increase safety is depicted in FIGS. **6**, **7** and **8**. A single airfoil shaped blade attached to the bottom of the platform causes autorotation of the payload and airfoil blade upon rapid descent. This replaces a traditional parachute with a highly reliable decelerator that is generally immune to fouling than a parachute and less complex. No deployment mechanism is necessary and it is immune to the fouling problems with animals after descent. The "maple seed" decelerator may also be used to conveniently house the platform antenna.

[0055] A novel method of platform recovery is depicted in FIG. **9**. To aid in the recovery of the platform, the landed platform sends its last recorded position to an additional airborne platform using a low power transmitter and tiny battery. The transmitter might utilize one of the low power unlicensed bands to send the information. The second platform relays the current location of the landed platform to the ground station to aid in recovery.

What is claimed is:

1. A system comprising a plurality of airborne platforms, each airborne platform comprising an unmanned balloon; a payload that is separate from the unmanned balloon; a transceiver; first and second flight termination devices; at least two separate power sources for the first and second flight termination devices; a sensor; a processor; a pump; a valve; and a tether that when broken separates the unmanned balloon and the payload;

wherein the pump and the valve are configured to change an altitude of the airborne platform;

wherein the sensor comprises a pressure sensor;

wherein, in operation, the unmanned balloon substantially drifts along with the wind currents;

wherein the transceiver is capable of communicating with a communication device that is separate from the unmanned balloon;

wherein each of the first and second flight termination devices has an ability to independently terminate a flight of the unmanned balloon;

wherein at least one of the geographical coordinates tracking system comprises a GPS;

wherein the unmanned balloon is configured to operate above an attitude of about 60,000 feet;

wherein the unmanned balloon has a flight duration capability that is longer than that of weather balloons that have flight durations of approximately 2 hours;

wherein the payload is configured to communicate with an additional airborne payload attached to a separate unmanned balloon;

wherein each of the first and second flight termination devices has an ability to independently terminate a flight of the unmanned balloon based on a determination that further operation of the unmanned balloon presents a danger to air traffic; and

wherein each of the first and second flight termination devices has an ability to independently terminate a flight of the unmanned balloon based on a determination of a malfunction of the unmanned balloon.

2. The system of claim **1**, the system further comprising an antenna and at least two geographical coordinates tracking system.

3. The system of claim **1**, wherein the payload remains attached to the unmanned balloon as one when landed unless the payload is separated from the unmanned balloon.

4. A system comprising a plurality of airborne platforms, each airborne platform comprising an unmanned balloon; a payload that is separate from the unmanned balloon; a transceiver; first and second flight termination devices; at least two separate power sources; a sensor; a processor; a pump; a valve; and a tether that when broken separates the unmanned balloon and the payload;